Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1-20. (Canceled)

21. (Previously presented) A composition comprising:

a semiconductor nanocrystal,

a linking group which has a distal end and a proximal end, the distal end being bound to an outer surface of the semiconductor nanocrystal and the proximal end including a first charged or ionizable moiety, wherein

the distal end includes S, N, P, O, or O=P;

the proximal end includes a hydroxide, an alkoxide, a carboxylate, a sulfonate, a phosphate, a phosphonate, or a quaternary ammonium; and

the distal and proximal ends are connected by a spacer, and

a fusion protein including a second charged or ionizable moiety, wherein the first and second charged or ionizable moieties electrostatically associate the semiconductor nanocrystal with the fusion protein to form an ionic conjugate.

22. (Previously presented) The composition of claim 21, wherein the spacer is selected from a bond, a branched or unbranched C2-C100 alkylene, a branched or unbranched C2-C100 alkenylene, a branched or unbranched C2-C100 heteroalkenylene, cycloalkyl, cycloalkenyl, cycloalkynyl, heterocyclic, aryl, and heteroaryl.

23. (Currently amended) The composition of claim 21, wherein the semiconductor nanocrystal includes a first semiconductor material**, the first semiconductor material being** ~~**selected from the group consisting of**~~ a Group II-VI compound ~~**, a Group II-V compound, a Group III-VI compound, a Group III-V compound, a Group IV-VI compound, a Group I-III-VI compound, a Group II-IV-VI compound, and a Group II-IV-V compound**~~.

24. (Previously presented) The composition of claim 21, wherein the semiconductor nanocrystal further comprises a plurality of linking groups each independently including a third charged or ionizable moiety.

25. (Previously presented) The composition of claim 24 further comprising a plurality of macromolecules, each of the macromolecules including a fourth charged or ionizable moiety, wherein the plurality of macromolecules are associated with the semiconductor nanocrystal via electrostatic interaction with the plurality of semiconductor nanocrystal linking groups.

26. (Canceled)

27. (Currently amended) The composition of claim 21, wherein the first charged or ionizable **moiety** ~~**group**~~ includes an hydroxide, alkoxide, carboxylate, sulfonate, phosphate, phosphonate, or quaternary ammonium.

28. (Original) The composition of claim 21, wherein the second charged or ionizable group includes an hydroxide, alkoxide, carboxylate, sulfonate, phosphate, phosphonate, or quaternary ammonium.

29. (Previously presented) The composition of claim 21, wherein the linking group has the formula:

$$(R_1)_a\text{-}R_2\text{-}[(R_3)_b(R_4)_c]_d$$

wherein

$R_1$ is selected from the group consisting of C1-C100 heteroalkyl, C2-C100 heteroalkenyl, heteroalkynyl, -OR, -SH, -NHR, -NR'R", -N(O)HR, -N(O)R'R", -PHR, -PR'R", -P(NR'R")NR'R", -P(O)R'R", -P(O)(NR'R")NR'R", -P(O)(OR')OR", -P(O)OR, -P(O)NR'R", -P(S)(OR')OR", and -P(S)OR, wherein R, R', R" are independently selected from the group consisting of H, a branched or unbranched C1-C100 alkyl, a branched or unbranched C2-C100 alkenyl, a branched or unbranched C2-C100 alkynyl, a branched or unbranched C1-C100 heteroalkyl, a branched or unbranched C2-C100 heteroalkenyl, a branched or unbranched C2-C100 heteroalkynyl, with the proviso that when a is greater than 1 the $R_1$ groups can be

attached to the $R_2$ or $R_3$ groups at the same or different atoms within those groups, the $R_1$ groups can be the same or different, or the $R_1$ groups can form a six, seven, eight, nine, or ten membered cycloalkyl, cycloalkenyl, heterocyclic, aryl, heteroaryl, or a six- to thirty-membered crown ether or heterocrown ether;

$R_2$ is selected from a bond, a branched or unbranched C2-C100 alkylene, a branched or unbranched C2-C100 alkenylene, a branched or unbranched C2-C100 heteroalkenylene, cycloalkyl, cycloalkenyl, cycloalkynyl, heterocyclic, aryl, and heteroaryl;

$R_3$ is selected from a branched or unbranched C2-C100 alkylene, a branched or unbranched C2-C100 alkenylene, a branched or unbranched C2-C100 heteroalkenylene, cycloalkyl, cycloalkenyl, cycloalkynyl, heterocyclic, aryl, and heteroaryl;

$R_4$ is selected from the group consisting of hydrogen, a carboxylate, a thiocarboxylate, an amide, a hydrazine, a sulfonate, a sulfoxide, a sulfone, a sulfite, a phosphate, a phosphonate, a phosphonium ion, an alcohol, a thiol, an amine, an ammonium, an alkyl ammonium, a nitrate; and

a is 1 to 40, b is 0 to 3, c is 1 to 30, d is 1 to 3, and when d is 2 or 3 the $R_3$ groups can be the same or different or can be linked together to form a five to ten members cycloalkyl, cycloalkenyl, heterocyclic, aryl, or heteroaryl.

30. (Original) The composition of claim 21, wherein the linking group has the formula

$HS\text{-}C_2H_4\text{-}CH(SH)\text{-}(C_4H_8)\text{-}COOH$.

31. (Original) The composition of claim 21, wherein the second charged or ionizable moiety is a leucine zipper.

32. (Original) The composition of claim 21, wherein the second charged or ionizable moiety is polyaspartate.

33. (Original) The composition of claim 21, wherein the fusion protein includes a maltose binding protein.

34. (Original) The composition of claim 21, wherein the fusion protein includes an immunoglobulin G binding protein.

35-58. (Canceled)

59. (Previously presented) A method of forming an ionic conjugate, comprising:

providing a semiconductor nanocrystal including a linking group having a distal end and a proximal end, the distal end being bound to an outer surface of the semiconductor nanocrystal and the proximal end including a first charged or ionizable moiety wherein the distal end includes S, N, P, O, or O=P, the proximal end includes a hydroxide, an alkoxide, a carboxylate, a sulfonate, a phosphate, a phosphonate, or a quaternary ammonium, and the distal and proximal ends are connected by a spacer; and

contacting a fusion protein having a second charged or ionizable moiety with the semiconductor nanocrystal, wherein the first and second charged or ionizable moieties electrostatically associate the semiconductor nanocrystal with the fusion protein to form an ionic conjugate.

60. (Previously presented) The method of claim 59, wherein the first semiconductor material is overcoated with a second semiconductor material.

61-66. (Canceled)

67. (New) The composition of claim 21, wherein the first semiconductor material is CdSe.

68. (New) The composition of claim 67, wherein the first semiconductor material is overcoated with a second semiconductor material.

69. (New) The method of claim 59, wherein the spacer is selected from a bond, a branched or unbranched C2-C100 alkylene, a branched or unbranched C2-C100 alkenylene, a

branched or unbranched C2-C100 heteroalkenylene, cycloalkyl, cycloalkenyl, cycloalkynyl, heterocyclic, aryl, and heteroaryl.

70. (New) The method of claim 59, wherein the semiconductor nanocrystal includes a first semiconductor material, the first semiconductor material being a Group II-VI compound.

71. (New) The method of claim 70, wherein the first semiconductor material is CdSe.

72. (New) The method of claim 71, wherein the first semiconductor material is overcoated with a second semiconductor material.

73. (New) The method of claim 59, wherein the semiconductor nanocrystal further comprises a plurality of linking groups each independently including a third charged or ionizable moiety.

74. (New) The method of claim 73, further comprising a plurality of macromolecules, each of the macromolecules including a fourth charged or ionizable moiety, wherein the plurality of macromolecules are associated with the semiconductor nanocrystal via electrostatic interaction with the plurality of linking groups.

75. (New) The method of claim 59, wherein the first charged or ionizable moiety includes a hydroxide, alkoxide, carboxylate, sulfonate, phosphate, phosphonate, or quaternary ammonium.

76. (New) The method of claim 59, wherein the second charged or ionizable group includes an hydroxide, alkoxide, carboxylate, sulfonate, phosphate, phosphonate, or quaternary ammonium.

77. (New) The method of claim 59, wherein the linking group has the formula:

$$(R_1)_a\text{-}R_2\text{-}[(R_3)_b(R_4)_c]_d$$

wherein

$R_1$ is selected from the group consisting of C1-C100 heteroalkyl, C2-C100 heteroalkenyl, heteroalkynyl, -OR, -SH, -NHR, -NR'R", -N(O)HR, -N(O)R'R", -PHR, -PR'R", -P(NR'R")NR'R", P(O)R'R", P(O)(NR'R")NR'R", -P(O)(OR')OR", P(O)OR, P(O)NR'R", -P(S)(OR')OR", and P(S)OR, wherein R, R', R" are independently selected from the group consisting of H, a branched or unbranched C1-C100 alkyl, a branched or unbranched C2-C100 alkenyl, a branched or unbranched C2-C100 alkynyl, a branched or unbranched C1-C100 heteroalkyl, a branched or unbranched C2-C100 heteroalkenyl, a branched or unbranched C2-C100 heteroalkynyl, with the proviso that when a is greater than 1 the $R_1$ groups can be attached to the $R_2$ or $R_3$ groups at the same or different atoms within those groups, the $R_1$ groups can be the same or different, or the $R_1$ groups can form a six, seven, eight, nine, or ten membered cycloalkyl, cycloalkenyl, heterocyclic, aryl, heteroaryl, or a six- to thirty-membered crown ether or heterocrown ether;

$R_2$ is selected from a bond (i.e., $R_2$ is absent in which case $R_1$ attaches to $R_3$), a branched or unbranched C2-C100 alkylene, a branched or unbranched C2-C100 alkenylene, a branched or unbranched C2-C100 heteroalkenylene, cycloalkyl, cycloalkenyl, cycloalkynyl, heterocyclic, aryl, and heteroaryl;

$R_3$ is selected from a branched or unbranched C2-C100 alkylene, a branched or unbranched C2-C100 alkenylene, a branched or unbranched C2-C100 heteroalkenylene, cycloalkyl, cycloalkenyl, cycloalkynyl, heterocyclic, aryl, and heteroaryl;

$R_4$ is selected from the group consisting of hydrogen, a carboxylate, a thiocarboxylate, and amid, an amine, a hydrazine, a sulfonate, a sulfoxide, a sulfone, a sulfite, a phosphate, a phosphonate, a phosphonium ion, an alcohol, a thiol, an amine, an ammonium, an alkyl ammonium, a nitrate; and

a is 1 to 4, b is 0 to 3, c is 1 to 3, d is 1 to 3, and when d is 2 or 3 the $R_3$ groups can be the same or different or can be linked together to form a five to ten members cycloalkyl, cycloalkenyl, heterocyclic, aryl, or heteroaryl.

78. (New) The method of claim 59, wherein the linking group has the formula $HS\text{-}C_2H_4\text{-}CH(SH)\text{-}(C_4H_8)\text{-}COOH$.

79. (New) The method of claim 59, wherein the second charged or ionizable moiety is a leucine zipper.

80. (New) The method of claim 59, wherein the second charged or ionizable moiety is polyaspartate.

81. (New) The method of claim 59, wherein the fusion protein includes a maltose binding protein.

82. (New) The method of claim 59, wherein the fusion protein includes an immunoglobulin G binding protein.